

ABSTRACT OF THE DISCLOSURE

Conventional fabrication of sidewall oxide around an ONO-type memory cell stack usually produces Bird's Beak because prior to the fabrication, there is an exposed sidewall of the ONO-type memory cell stack that exposes side parts of a plurality of material layers respectively composed of different materials. Certain materials in the stack such as silicon nitrides are more difficult to oxidize than other materials in the stack such polysilicon. As a result oxidation does not proceed uniformly along the multi-layered height of the sidewall. The present disclosure shows how radical-based fabrication of sidewall dielectric can help to reduce the Bird's Beak formation. More specifically, it is indicated that short-lived oxidizing agents (e.g., atomic oxygen) are able to better oxidize difficult to oxidize materials such as silicon nitride and the it is indicated that the short-lived oxidizing agents alternatively or additionally do not diffuse as deeply through already oxidized layers of the sidewall such as silicon oxide layers. As a result, a more uniform sidewall dielectric can be fabricated with more uniform breakdown voltages along it height.